MINUTES
CALIFORNIA TRAFFIC CONTROL DEVICES COMMITTEE (CTCDC)
MEETING Oakland, December 8, 2004

The last CTCDC meeting of year 2004 was held in Oakland, on December 8, 2004.

Chairman John Fisher opened the meeting at 9:40 a.m. with the introduction of Committee Members and guests. Chairman Fisher thanked Caltrans District 4 for hosting the meeting. The following Members, alternates and guests were in attendance:

ATTENDANCE	ORGANIZATION	TELEPHONE
Members (Voting)		
John Fisher Chairman	League of CA Cities City of Los Angeles	(213) 580-1189
Farhad Mansourian Vice Chairman	CA State Association of Counties Marin County	(415) 499-6570
Gerry Meis	Caltrans	(916) 654-4551
Lenley Duncan	CHP	(916) 657-7222
Ed von Borstel	League of CA Cities City of Modesto	(209) 577-5266
Lewison Lem (Alternate)	California State Automobile Association	(415) 241-8904
Jacob Babico	CA State Association of Counties San Bernardino County	(909) 387-8186
Hamid Bahadori	Auto Club of Southern California	(714) 885-2326

ALTERNATES	ORGANIZATION	TELEPHONE
Gain Aggarwal	League of CA Cities City of Vacaville	(707) 449-5349

ATTENDEES	ORGANIZATION	TELEPHONE/E-Mail
Johnny Bhullar	Caltrans	Johnny_Bhullar@dot.ca.gov
Matt Schmitz	FHWA	matthew.schmitz@fhwa.dot.gov
Bret P. Goss	First Call Flagger	bret@firstcallflagging.com (503) 269-6296
Maurice Palumbo	Golden Gate Bridge Hwy And transportation District	mpalumbo@goldengate.org
Bob Preston	Alameda County	bob@acppwa.org
Yugy Ruiz	LA County	yruiz@ladpw.org
Tighe F. Hudson	LA County Counsel	(213) 974-1885
Robert L Thompson	Fresno County	(559) 262-4240
Julie Likes	CHP	
Ginny Micham	CHP	
Peter Naghavi	Traffic Services Manager, Costa Mesa	
Marianne Milligan	Costa Mesa	
Duncan Hughes	City of San Diego	drhughes@sandiego.gov (619) 533-3757
Roger Bazeley	Design Strategy-USA PTA Safety/Advocate	bazeley@earthlink.net (415) 673-3652
Joe Genovese	City of Oxnard	joe.genovese@ci.oxnard.ca.us
Reza Moghissi	Sacramento County	moghissir@saccounty.net
Chng-Yao Chan	UC Berkeley	
Bahman Janka	City of Pasadena	bjanka@cityofpasadeena.net (626) 744-4610
Chalpa Sadam	Albert Grover & Associates	chalap@albertgrover.com
Jesse Bhullar	Caltrans – HQ	jesse_bhullae@dot.ca.gov
Don Howe	Caltrans – HQ	don_howe@dot.ca.gov
Tamie McGowen	Caltrans – HQ	Tamie_McGowen@dot.ca.gov
Jerry Champa	Caltrans – HQ	jerry_champa@dot.ca.gov
Mike Sallaberry	San Francisco-DPT	mike.sallaberry@sfgov.org

MINUTES

Adoption of August 12, 2004 CTCDC meeting minutes.

Motion: Moved by Jacob Babico, seconded by Ed von Borstel, to adopt the Minutes of August 12, 2004 CTCDC meeting held in San Diego. Motion carried 8-0.

Membership:

Chairman Fisher introduced Captain Lenley Duncan as the voting member representing the California Highway Patrol (CHP) replacing Captain Bridgett Lott. Also, Lieutenant Mark Mulgrew replaced John Olejnik as the CHP alternate member. Merry Banks, California State Automobile Association, was represented by her alternate Lewison Lem.

Public Comments:

Chairman Fisher asked for public comments on any item not appearing on the agenda.

Joe Genovese, Traffic Engineer, City of Oxnard, stated that speed zone engineering and traffic survey procedures require revisiting because of the lengthy documentation required. Due to staff limitations and funding constraints, agencies are not able to keep survey updated. He noted that the California Vehicle Code allows extending a speed survey up to ten years if conditions have not been changed. He advocated conducting speed surveys more frequently, however, the documentation should be simpler.

Robert Thompson suggested modifying language in the California Supplement to resolve the inconsistency of using the 5-MPH nearest the 85% percentile and that of the next lower 5 MPH, preferring the "nearest" language over the "next lower" 5 MPH increment.

Roger Bazely, Parent Teachers Association, San Francisco, stated that he is proposing four new School Zone signs which will cover school bus loading, parent/car pick-up/drop-off, no loading and no passing-no U-turn signs. The purpose of these signs is to create a uniform and clear message to drivers, direct traffic in school zones, reduce congestion, and reduce collisions during the peak school drop-off/arrival and pick-up/departure times. He stated that he is working with the San Francisco School District and with the Auto Club. He added that proposed signs along with the existing school zone traffic control devices would provide a complete and uniform kit to maximize driver awareness and safety in school zones.

Bret Goss, First Call Flagger, stated that he came to the Committee a year ago and presented the concept of the Remote Controlled Flagging technique. Since then, the Federal Highway Administration has issued interim approval on two types of flagging systems. However, his device is not covered under that approval. He stated that the County of Placerville, California would like to use his device and the County will submit a request to the Committee to place this on the agenda for the next meeting. He stated that if other public agencies would like to use his device, he will provide full assistance.

Chairman Fisher asked if anyone wants to rearrange an agenda item.

Gerry Meis responded that he might request a change based on arrival time of Caltrans staff to present Item 04-10 (slow for the cone zone).

Public Hearing:

00-1 Yellow Change Interval Timing

Chairman Fisher stated that the first agenda item 04-7, yellow change interval timing (YCIT) for signals, was discussed during the last CTCDC meeting and a Sub-Committee was formed to study the issue and to submit a recommendation for the Committee's consideration. He congratulated the Sub-Committee on submitting a detailed discussion. He asked Hamid Bahadori, Chairman of Sub-Committee to provide a summary of the findings.

Hamid thanked Chairman Fisher for the thoughtful words and stated that the issue of yellow change interval timing (YCIT) has been around for years. Municipalities in California have traditionally used the Caltrans Traffic Manual. for the yellow signal timing. Now practitioners use table 4D-102 of the California Supplement to the MUTCD 2003(which recently replaced the Traffic Manual) which recommends the minimum YCIT be based on the "Approach Speed" of vehicles. However, the MUTCD 2003 and the California Supplement do not offer a clear definition of "Approach Speed", and these documents are silent on whether this minimum timing should also apply to protected left-turn phases.

There was no controversy before the placement of "red light enforcement cameras" (RLEC). The RLECs are used to discourage motorists from red light violations, however, if the YCIT is not properly set, there will be a tremendous increase in violators. The RLEC violation has been challenged and the courts have thrown out violations because the approach speed is not defined and the minimum YCIT is based on the approach speed. Hamid added that the City of San Diego monitored four intersections equipped with RLECs and found that a minor increase in YCIT caused a tremendous increase in the number of violations. When the City had a 3.5 seconds YCIT there were approximately 5000 violations, when it was increased to 5 seconds the violations were reduced to between 500 to 600.

Hamid added that RLECs are very sensitive and motorists will get citations if the proper YCIT is not allocated for the signals. Therefore, it is necessary to define approach speed because this speed will be used to determine the minimum YCIT. He briefly went over the Sub-Committee discussion on this issue. Hamid stated that he would not go over all the Sub Committee discussion, however he would briefly discuss two alternatives:

> First alternative: for all applications use Table 4D-102, California Supplement for determination of the minimum YCIT use "Approach Speed" as the posted speed limit, or the prima facie speed limit established by the California Vehicle Code (CVC) in absence of a posted speed limit.
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> Second alternative: for all applications use Table 4D-102, California Supplement for determination of minimum YCIT use "Approach Speed" as the 85th percentile speed rounded to the nearest 5 mph increment or rounded up to the nearest 5 mph increment.

Approach Speed as the Posted Speed Limit

Hamid stated that the most obvious and simplest alternative is to simply define the "Approach Speed" as the posted speed limit, or the prima facie speed for un-posted roadways. An advantage of using the posted speed is its availability for filed practitioners. If the roadway has a posted speed limit, a field technician can simply use the posted speed limit in application of Table 4D-102 of the California Supplement to determine the yellow change interval. For roadways that do not have a posted speed limit, the CVC assigns the prima facie speed, which is commonly known and can be applied in using Table 4D-102.

Hamid added that another advantage of using the posted speed limit, as "Approach Speed" is that this is the "legally established" speed for the arterial, and may be more defensible in courts for cases involving the automated red-light violation tickets.

Hamid stated that the disadvantage of using the posted speed limits are, it is usually a few miles below the measured 85th percentile speeds, as they are rounded downward to the nearest 5-mile increment of the 85th percentile speed, as defined in Section 2B.116, of the California Supplement under guidance. Additionally, the posted speed limits are

lowered using the provision of "conditions not readily apparent to the drivers" such as proximity to schools, presence of pedestrians or equestrian, etc. Therefore, exclusively applying the posted speed limit for calculation of the yellow clearance time may not achieve the goal of eliminating the dilemma and may cause trap conditions by forcing motorists in an unsafe manner into intersections, or sudden and unexpected stops resulting in a higher number of rear-end collisions.

Hamid added that the variance between the "posted" speed and the 85th percentile speed is, in the great majority of cases, within a range of 0 to 4 MPH. However, in other cases the posted speed limit could be lower than the 85th percentile by as much as 9 MPH. In those cases using the posted speed limit to determine the minimum yellow change interval will obviously have an adverse effect on traffic safety. These circumstances would also require special engineering judgment beyond the simple determination of yellow timing based solely on the posted speed limit.

Hamid stated that some subcommittee members argued that the posted speed is the speed adopted for the roadway segment as designated by the responsible legislative body, and is established as the law to be obeyed. The 85th percentile is only one factor in establishing the legal speed limit. Therefore, they were concerned that using any speed higher than the "posted speed" begs the question if engineers should be expected to use a higher speed, than what has been determined to be "legal", to determine the yellow clearance. Applying the posted speed to determine yellow clearance has been the standard practice among many agencies. Legal challenges are rarely encountered where a defendant disputes the adequacy of yellow time based on the appropriately set posted speed limit. In most recent red light running court hearings, where yellow interval settings are debated, the focus has been mostly on discrepancies in yellow timing "methodology" and not the deficiencies in yellow time itself. This discrepancy in yellow timing "methodology" is the impetus for establishing clearer approach speed standards.

Therefore if the historical application of posted speed to determine yellow clearance is typically not found deficient, and given the posted speed limit is the agency established legal speed, then it can be argued that the posted speed limit should be the standard criteria for "Approach Speed". However, the opponents of this alternative still argued that using the "posted speed limit" to determine the yellow change interval would compromise traffic safety by providing inadequate yellow times.

Approach Speed as the 85th Percentile Speed

Hamid shared the advantage and disadvantage of using the 85th percentile speed as "Approach Speed". Although this approach may address many of the safety concerns, it has several constraints in its actual application. First, the 85th percentile speed is a "raw" number and seldom is at exact 5-MPH increment that is needed in the application of Table 4D-102. Therefore, some kind of adjustment to the precise 85th percentile speed must be made to make it useful in determining the minimum yellow change interval value in Table 4D-102. Second, speed surveys to determine the 85th percentile speed are mostly taken some distance away from the proximity of signalized intersections to benefit from the relatively free flow conditions. An argument may be made that these speeds, as a result, are not truly representative of the speed of vehicles approaching the traffic signal. The correct definition of "Approach Speed" is the speed of vehicles approaching the signalized intersection, which is invariably different that the mid-block travel speed obtained from standard speed studies. Therefore; a true representation of the approach speed based on the 85th percentile would require that separate speed surveys be conducted at the approaches of each intersection, which would then comply with the correct intent and more critically, be "legally defensible". The effort to compile this extent of speed data for each intersection approach would be well beyond the capability of most agencies.

It was also suggested that speed survey, especially in larger jurisdictions, are normally conducted and maintained by different group of staff than those responsible for signal operations. Therefore, the 85th percentile speed information may not be readily available to signal operations staff. However, at freeway ramp intersections where Caltrans is responsible for the maintenance and timing of the traffic signals, while the arterial approaches are owned and maintained by local jurisdictions, this may pose some serious inter-jurisdictional and logistical challenges.

It was also argued that the 85% typically change with each radar study, and so creates a moving target. Such ongoing changes in clearance time may cause complications with extended court proceedings and with signal timing and maintenance personnel. Nonetheless, applying the 85th may result in significantly more changes to yellow

clearance time on an ongoing basis with associated increased potential in litigation exposure; whereas, use of the posted speed limit may minimize timing variations should continued application of the posted speed be determined safe as is generally acknowledged.

Some members of the subcommittee argued that the agencies adopted posted speed limit would provide less variability and volatility. They believed that during the 5 to 7 year transition periods when speed studies are re-assessed as legally required, yellow timings will inevitably change on a wide scale, and discrepancies could lend to legal problems. Additionally, should the 85th be applied, any corridor operating under a consistently posted speed limit would likely require different yellow clearance times for each signalized intersection, given the fact that the 85th percentile is inevitably different for every segment of the corridor. This probable "inconsistency" in yellow clearance times along an extended roadway posted at a common speed limit would create varying expectations for motorists and contribute to legal disputes. It was further argued that the 85th percentile speed still does not account for the 15% of motorists exceeding this theoretical limit anyway. Safety factors for motorists within this 15% margin would remain unrecognized by adjustments to the clearance time, similar to those travelling over the "posted speed limit", if that speed is used as the "Approach Speed"; therefore, using the 85th percentile speed will not completely resolve the safety concerns associated with the use of "posted speed limit" anyway.

Hamid noted that the other question discussed by the Sub-Committee was the minimum YCIT for the left-turn movement. The California Supplement does not make any recommendations regarding the reduction of the minimum YCITing shown in Table 4D-102.

In closing, Hamid stated that reviewing all the pros and cons presented by the Sub-Committee members, he is leaning towards defining the Approach Speed as the posted speed or the prima facie speed in the absence of the posted speed. This is the "legally established" speed for the arterial, and may be more defensible in courts for cases involving the automated red-light violation tickets.

Chairman Fisher opened discussion among Committee Members.

Captain Duncan stated that he is participating in this discussion for the first time, however after listening to the Sub Committee's report and alternatives, he believes that option which use 85th percentile speed provides maximum YCIT. The primary goal of the CHP is safety.

Gerry Meis added that the 85th percentile speed would be appropriate to use as an approach speed to calculate minimum YCIT, however the major impact of this will be on the Cities and Counties.

Farhad Mansourian added that during the Sub-Committee's discussion, the minimum YCIT issue was discussed in detail. The group represented in the Sub-Committee had different professional backgrounds such as legal, engineering, and public dealing. A number of options were discussed, however, two options were discussed in detail: First option was to use posted speed limit as a approach speed, and second was to use 85th percentile speed as a approach speed. In his opinion, the posted speed limit should be used as an approach speed to calculate minimum YCIT because that is the legal speed for that roadway. The posted speed is developed using a number of tools such as 85th percentile speed observed in the field and engineering judgement. The engineering judgement includes a number of factors such as alignment of the roadway, adjacent features, and accident data. He further added that the YCIT calculated by using a posted speed is the minimum yellow change interval time and jurisdiction could use higher time if they believed it justified, however they can not use less than that. During the Sub-Committee discussion, there was a belief to use 85th percentile rounded to the nearest 5-mph increment or rounded up 5 mph in every case. He strongly opposed that approach because, posted speed limit is established by using engineering judgement and that is the legal speed for that roadway. It is easily available to field staff, who is adjusting signal operations and in the absence of posted speed limit prima facie speed is the approach speed. The reason the violation does not hold up in court is because both the MUTCD 2003 and California Supplement are silent on the definition of an approach speed. When this body recommends Caltrans to define the approach speed and a policy is issued, that will be a regulation and the community has a clear policy of what will be enforced. Other case, presently there is no clear definition of the approach speed. Furthermore, if any options are taken, there will be a small difference in the YCIT. He stressed that the definition of approach speed to be considered as the posted speed limit, or the prima facie speed limit established by the California Vehicle Code (CVC) in absence of a posted speed limit and should be used to calculate a minimum YCIT.

Ed van Borstel added that he agreed with the comments of Lenley Duncan and Gerry Meis since safety is the main concern, and that using the 85th percentile provides more YCIT. He will go along with using the 85th percentile speed as an approach speed.

Jacob Babico asked by defining the approach speed if it would impact other features of the signals such as location of the advance loops detectors, capacity, cycle length, etc.. In his opinion, the Committee does not have a final product to define approach speed, because the change would impact other features of signals.

Lewison Lem stated that he is not concerned about legal issues, however, there is a need to clarify the situation. Because the approach speed is not defined and violations are not holding up in court due to non-clarity of the approach speed.

Chairman Fisher stated that during the last meeting, he had a different view for the definition of approach speed. However, after receiving a report from the Sub-Committee and reviewing it, his opinion had changed. The standards for all public roadways have minimum values which must be kept unless there is a strong justification to go lower than minimum. He cited an example on sign standards, travel lane width, walk time for pedestrians, all these components having minimum values which practitioner must consider or they can use higher values if needed. So in his opinion, he suggested having standards for a minimum value for the YCIT and give latitude to the practitioner if there is a need for higher YCIT, they can use higher values. He added that by defining approach speed as a posted speed limit, there is clarification to practitioners, so everyone has to use that as a minimum for the YCIT. In Los Angeles, in determining the minimum YCIT, the City use the posted speed limit plus 5-MPH. He suggested using the posted speed limit as an approach speed, and in absence of posted speed limit, the prima facie speed as the approach speed.

Hamid stated that after analyzing all three options, the maximum difference could be 10-mph and the yellow timing difference will be 0.7 seconds. The use of 85th percentile will create more challenges such as with coordination and the availability of the data to field staff as well as inter-agency involvement. After going through this exercise, he suggested using the posted speed limit as an approach speed. It is simpler, available, and it is a minimum in determining the YCIT.

Lenley Duncan stated that the posted speed limit would not represent the 85th percentile of the traffic going through that intersection. In his opinion, realistic speed is 85th percentile to provide safer YCIT.

Gerry Meis stated that sometimes the posted speed limit is placed on a local neighborhood roadway under political pressure and that it would not serve law-abiding citizens. The 85th percentile speed is a realistic speed and the majority of traffic approaching the intersection is travelling at that speed.

Chairman Fisher stated that there are a number of factors involved in setting a YCIT for signals, such as perception and reaction time for braking that varies from ½ second to 2 seconds. The whole point is, these values vary. When motorists reach the dilemma zone, some will stop, some will not. He added that the YCIT for the signal will not only depend upon speed limits, but there is a need to look at different contents like road users. The posted speed limit will give the minimum YCIT to start with and other factors have to be looked by the agency to justify safe operation. He stated that his initial judgement was to use 85th percentile. After reviewing the argument from the Sub-Committee report, it is not practical to use 85th percentile speed to set YCIT. In Los Angeles, there are 17000 yellow signals to time, the City will have to get the 85th percentile speed survey for all and there will be legal issues as to where the speed was taken. Due to safety, the City uses the posted speed limit and adds 5-MPH as a safety factor to provide enough YCIT. If the Committee adopts option "A", that is a minimum and agencies will have to provide that yellow clearance in any case, however, there is no limitation to going over the minimum.

Farhad Mansourian stated that during the discussion the safest YCIT was the issue and by using the posted speed limit there will be consistency throughout the State. He added that two standards are not practical, when there are no cameras and when there are cameras. The agencies are allowed to use engineering judgement to establish a speed limit for a roadway and that speed is used in determining minimum YCIT, and when cameras are used, engineering judgement is not recommended, instead 85th percentile speed will be used. The different standard will create more litigation. He stated that the Committee needs to make a decision and provide clarity to their Legal Branch, so they can defend any citation based on the policy. He commented on Jacob's previous statement. Farhad

stated that by using a posted speed limit as an approach speed, it would not change any features such as location of the advance loop detector, capacity, level of service or cycle length. However, the 85th percentile will have an effect on all the features of an intersection. He urged the Committee to make a decision and provide clarity.

Jacob Babico added that he agreed with establishing a minimum yellow timing, however he will go backward. He will first determine the minimum YCIT that is required for particular intersections and based on that he will calculate the speed.

Chairman Fisher asked the audience if they have any comments.

Peter Naghavi, Traffic Services Manager, City of Costa Mesa, thanked the Sub-Committee on the work they have done to put together a detailed discussion. He stated that the City of Costa Mesa has only four intersections equipped with RLECs and has lost million of dollars, because of the approach speed not being defined. He urged the committee to come up with a policy so this issue can be prevented in the future. He added that the 85th percentile speed survey is a moving target, the speed will be different if you conduct a survey today and it will be different if you conduct survey next week, then in that case, he questioned which number will be used. The 85th percentile speed will be different in opposing directions, so it means to use two YCITs for the same intersection. The 85th percentile speed for the mid-block and at the intersection will be different, which would be used. There will be a coordination issue, using 85th percentile speed at one intersection and a different speed at other intersections that will cause a trap in the traffic flow. Coordination is needed for the smooth flow of traffic.

Peter further stated that he heard comments that 85th percentile speed will provide longer YCIT and it will be safe. He stated that the safety should be the same for all intersections, not just for the intersection with RLECs. He further added that once everyone knows there is so little difference in timing, so why would it raise more legal issues. He added that the posted speed limit is the legal speed and he urged the Committee to use that as an approach speed because it is simple, available and this is a minimum agency has latitude to go higher.

Gerry Meis commented that the 85th percentile speed could be used for the intersections equipped with the RLECs. Other stated that is not possible because, you can not have two different criteria in determining of the minimum YCITing for signals.

Jacob Babico asked where would be the location for the 85th percentile speed survey in relation to the intersection. He added that the driver speed would change based on the signal indications, if the light is green the speed will be higher, if light indication changed from green to yellow, the speed will be lower.

Hamid responded that Sub-Committee entertained that discussion and it was recommended that when an agency conducts an 85th percentile speed survey it should be a certain distance from the intersection.

Gain Aggarwal, Alternate Member, commented that 85th percentile speed will not represent the actual speed of vehicles because during the green signal and yellow signal indications, speed will vary. The location of the speed survey will raise a number of questions, why not here instead of there. He suggested using the posted speed limit as an approach speed and this is a minimum in determining the YCIT, so agencies have latitude to go higher, if it is justified.

Joe Genovese, City of Oxnard, stated that they used the most recent speed survey available plus 5-MPH increments in determining the YCIT and if a speed survey is not available they use the prima facie speed. He also suggested that the Committee should address the protected left-turn minimum yellow timing. He suggested 3 seconds minimum for the left turn and agencies could use more if it is justified based on their field evaluations. He commented that there were comments that the posted speed limit and 85th percentile speed has only 0.7 seconds difference. He added that at 45-MPH speed, a motorist could travel 40 feet in 0.7 seconds, which is a significant distance traveling through an intersection.

Marianne Milligan, City of Costa Mesa, thanked Hamid for coordinating the Sub-Committee meetings and presenting a detailed discussion to the CTCDC. She suggested that the approach speed be considered the posted speed limit and this be used in determining the YCIT by using Table 4D-102 and if engineering judgement suggest

to use higher YCIT, that it should be above the minimum. She stated that a clear definition of the approach speed would helpful to defend a citation in court, if ever challenged. The use of the 85th percentile speed will create legal issues such as where the speed survey was taken in relation to the intersection. For the left-turn movement, she suggested to use a minimum of 3.0 seconds, even though some agencies are using minimum 3.2 second. As long as a clear policy is defined in the California Supplement and it is consistent through out the State, it will be defendable in a court of law.

Roger Bazely stated that for the pedestrian and motorists safety point of view the minimum YCIT is an important factor. He suggested to having a clear policy which provides minimum yellow timing. He added that the City of San Francisco has installed RLECs in response to running red light violators. The yellow interval should be constant and red/green can be variable which related to traffic flow. He stated that the posted speed limit some times does not reflect the actual speed.

Duncan Hughes, Senior Traffic Engineer, City of San Diego, stated that the City uses, and will continue to use, the higher of the 85th percentile speed or the posted speed limit as the approach speed to calculate an appropriate yellow time. For speeds not shown in Table 4D-102, the City extrapolates between the values listed in Table 4D-102. For this reason the City would like to see the equation used to derive the values in the table included in the California Supplement. In general, the City feels the 85th percentile should be used to calculate through movement yellows as being more representative of speed on the approach. The City of San Diego has a significant proportion of roadway segments where the posted speed limit is 6 or more mph below the 85th percentile. However, the City supports adding language to the Supplement which establishes use of the posted speed limit as the "*minimum approach speed*", since this will not affect our policy. Language should be added to the Guidance section of 4D.10 stating to use engineering judgement on other speeds, such as the 85th percentile speed, which may be used instead.

Duncan Hughes further added that the yellow times for protected left turn phases should be calculated differently. Data from photo-enforced left turn moves in San Diego at 8 locations show the average turn speed of violating vehicles to be between 17 and 24 mph. A ninth location showed an average turn speed of violators of 33mph. The turn at this location is less than 90 degrees, leading to higher turn and approach speeds and the yellow is set longer accordingly. Based on this, the City feels that the *minimum* yellow value for protected left-turn phases should be 3.0 (25mph) or 3.2 (30mph), again allowing for increases based on engineering judgement.

Kawan Lau, Office Chief, Signal Operations, Caltrans D4, stated that he has concerns on adding language in the California Supplement due to the RLECs. His understanding is RLECs are not a part of the signal system. Secondly, the majority of the signalized intersections do not have RLECs in California, so why make a change when the system is not a part of the signals. Caltrans designs, operates signal system for maximum safety and accommodates the majority of users. He suggested not making any change to the policy because of the issue which was driven by a non-part of a signal system.

Robert Thomson, County of Fresno Public Works Department, stated that Fresno County has a majority of rural highways with two-lane roadways. As he earlier commented, the speed survey needs to be consistent, some rounded 5-MPH up to the nearest 85th percentile and some rounded 5-MPH down to the nearest 85th percentile.

Chairman Fisher asked for other comments from the audience. There were none. Chairman Fisher asked Committee members if they have any more comments.

Hamid Bahadori stated that the equation to calculate yellow timing is not in the California Supplement. He asked Johnny Bhullar to include the equation back to the California Supplement. Hamid Bahadori reiterated that after discussing with Sub-Committee members and listening to the Committee's discussion, he is convinced that the best way to define approach speed is the posted speed limit, because it is available to the field practitioner and that is the minimum.

There were no other comments.

Motion: Moved by Hamid Bahadori seconded by Farhad Mansourian, in applying Table 4D-102 for the calculation of the minimum YCIT, the "approach speed" is defined as the posted speed limit, or in the absence of the

posted speed limit, a prima facie speed shall be used. In addition, include the equation in the California Supplement for the calculation of the minimum "YCIT".

Motion carried 6-2 (Gerry Meis and Captain Lenley Duncan voted against the motion).

Chairman Fisher asked the Committee members that the minimum yellow time for the exclusive phases should also be addressed because both the MUTCD 2003 and the California Supplement are silent on this issue. Chairman Fisher asked Committee members for comments.

Hamid Bahadori stated that the current MUTCD 2003 and California Supplement has no reference to the yellow change interval timing for the exclusive left-turn phase. The minimum yellow time for the left-turn should be less than the through traffic, because the speed for the left-turn movement will be lower than the through traffic. In his opinion, the Committee has enough information provided in the Sub-Committee's report to make a decision.

Chairman Fisher stated that the left-turn traffic or any turning movement's speed would be much lower compare to the through traffic. A conventional intersection with conventional geometry (80 feet plus minus width), the left-turn speed would be around 25-MPH. He suggested that the committee consider a minimum 3.0 seconds yellow change interval time based on the 25-MPH speed for the exclusive turning phases and allowing jurisdictions to increase this value based on the length of the left-turn pocket, width of intersection etc.

Farhad Mansourian and Jacob Babico agreed with Chairman comments.

Chairman Fisher asked comments from the audience. There were none.

Motion: Moved by Hamid Bahadori and seconded by Farhad Mansouiran, the minimum yellow change interval time for any exclusive turning phases at a signalized intersection shall be 3.0 seconds (based on the 25 mph speed limit). Based on appropriate judgement, traffic conditions and geometry of the intersection, this value may be increased.

Chairman Fisher asked for vote on motion. Motion failed 5-2 (six votes are needed to pass a motion). Gerry Meis stated that the reason he voted against because, he is not clear about the motion. He asked for clarification about the motion.

Chairman Fisher responded that the current MUTCD 2003 and California Supplement does not address yellow change interval time for the turning movements. Based on the current policy, if a jurisdiction provides less yellow time for the left-turn movement compared to the through movement, it can be challenged in court. The purpose is to provide a minimum yellow change interval time for the protected left-turn movement and if an agency justifies in going higher, they have latitude to do so.

Gerry Meis asked Marianne Milligan, Attorney's Office, City of Costa Mesa, whether the Committee was creating any legal issues by setting a minimum yellow change interval time for the protected turning movements.

Marianne Milligan responded that as long as it is defined minimum and references Table 4D.102 to be used, this would be helpful for uniformity and consistency.

Lenley Duncan asked if this would be only for RLECs or for all intersection.

Chairman Fisher responded no, it will be applicable for all signalized intersections. Chairman Fisher asked any other comments. There were none.

Chairman Fisher asked to vote on the motion again.

Motion carried 7-0.

04-8 Railroad Preemption Signals

Chairman Fisher stated that agenda item 04-8 is to revise Sections 8B.06, 10C.09 and Figures 8B-3, 10C-2 of the MUTCD 2003 and include in the California Supplement by deleting stationary signs and replacing them with activated blank-out signs. The proposed language would allow the use of symbol signs instead of the word message signs. California believes that symbol messages are more effective with LED technology. He added that in the agenda packet there are two figures listed under Section 8B.06, however the correct figure would be 8B-3 as shown on page 19 of 55. He further stated that the R5-1 sign, the outer perimeter-background of the message would be blanked out instead of white as shown in the figure 8B-3 and figure 10C-2. He added that Figure 8B-3 and 10C-2 will be revised by deleting word message signs R3-1a and R3-2a, and replaced with activated blank-out "No Left-Turn", "No Right-Turn" symbol signs and with the "Do Not Enter" word message sign. He further added that this was discussed during the workshops held during the MUTCD adoption process. Finally, when the California Supplement was adopted these comments were not incorporated. He asked for comments from the Committee members. There were none. Chairman Fisher asked for comments from the audience.

Bahman Janka stated that City of Pasadena has used a "no left turn" sign at an intersection close to the light rail and it flashes during the preemption period which could be seen from half a mile away. The flashing mode visibility is better in comparison to the steady mode. He suggested that under this option, language could be included allowing the sign to be used in flashing mode.

Johnny Bhullar stated that the numbers used for activated blank-out signs require renumbering, because those numbers belongs to stationary signs. He added that Caltrans has to develop policies and specifications for these blank-out signs.

Chairman Fisher asked whether renumbering and absence of sign specifications would create any obstacles for the Committee to take action.

Johnny responded that it should not stop the Committee in taking action, however Caltrans will develop sign specifications and run it through the Committee for comments.

Roger Bazely asked about the language included in the agenda packet saying the sign "may" be used. He commented that this is not a strong recommendation.

Chairman Fisher responded that there is more than one method to control turning movements. For example, instead of using a sign, there may be a red signal arrow to prohibit turning.

Chairman Fisher asked for other comments from Committee members and the audience.

There were no other comments

Motion: Moved by John Fisher and seconded by Farhad Mansourian, to adopt revised Sections 8B.06, 10C.09 and Figures 8B-3, 10C-2 of the MUTCD 2003 and to include in the California Supplement as amended and to ask Caltrans to develop policies and specifications for blank-out signs.

Motion carried 7-0.

02-16 Signal Warrants I and II

Chairman Fisher asked Jacob Babico to address agenda item 02-16.

Jacob stated that this item was placed on the agenda in 2002 to restore footnotes for signal warrants I and II, which were deleted during the 1996 update of the Traffic Manual. Subsequently Caltrans adopted the MUTCD 2003 along with the California Supplement. Now, the MUTCD 2003, Section 4C.01 has similar language to those footnotes. However the language is not clear. During the last meeting, it was suggested to clarify the MUTCD 2003 Section 4C.01 language so that the users can understand and implement correctly. The revised "option" under Section 4C.01 (Italic) is as follows:

4C.01 Option:

At an intersection with high volume of left-turn traffic from the major street, the signal warrant analysis may be performed in a manner that consider the higher ~~of the major street left-turn volumes as the "minor street" volume and the corresponding single direction of opposing traffic on the major street as the "major street" volume~~ *volume of the major-street left-turn volumes plus the higher volume minor-street approach as the "minor street" volume and both approaches of the major street minus the higher of the major-street left-turn volume as "major street" volume.*

Chairman Fisher asked for comments from Committee members and the audience. There were none.

Motion: Moved by Hamid Bahadori, seconded by John Fisher, recommended that Caltrans adopt the revised Section 4C.01 of MUTCD 2003 and include in California Supplement.

Motion carried 7-0.

04-13 Older Californian Traffic Safety Task Force (Proposal to amend Sections 2B.45, 2C.50 and 4E.10 and include in California Supplement).

Chairman Fisher asked Gerry Meis to address agenda item 04-13. Gerry Meis stated that during the last meeting three items were discussed with the Committee and now the Older Californian Traffic Task Force is requesting the Committee to officially adopt these amendments and include it to the California Supplement. Gerry asked Jesse Bhullar, Office Chief, Traffic Safety, Division of Traffic Operations, to share the proposal with the Committee.

Jesse Stated that he chairs the Transportation Safety Group and the group is reviewing FHWA guidelines published on older drivers and pedestrians. Most of the guideline recommendations have been incorporated in the MUTCD 2003, however some of the recommendations have not been included. During the CTCDC meetings, the Transportation Safety Group will share future items they want to bring to the Committee first as an information item and then during the following meeting, the same items will be action items for the Committee's consideration. Jesse invited Johnny Bhullar, member of the Transportation Safety Group to share technical aspects of the proposals.

Johnny stated that during the last meeting these three items were shared with the Committee and the first item was California Supplement Section 2B.45, "No Turn On Red" sign. The existing language in the California Supplement under option is as follows:

> **Section 2B.45 Traffic Signal Signs (R10-1 through R10-21)**
> Option:
>
> A supplemental sign, to the NO TURN ON RED (R10-11a) sign, may be used on the near right or left at intersections that are extremely wide or skewed.

Johnny further stated that MUTCD Section 2B.45 under the guidance says:

> If used, the NO TURN ON RED sign should be installed near the appropriate signal head. A NO TURN ON RED sign should be considered when an engineering study finds that one or more of the following conditions exist:
> A. Inadequate sight distance to vehicles approaching from the left (or right, if applicable);
> B. Geometrics or operational characteristics of the intersection that might result in unexpected conflicts;
> C. An exclusive pedestrian phase;
> D. An unacceptable number of pedestrians conflicts with right-turn-on-red maneuvers, especially involving children, older pedestrians, or persons with disabilities; and
>
> E. More than three right-turn-on-red accidents reported in a 12-month period for the particular approach.

Johnny stated that the proposed recommendations are more specific and the language tightens policy, which recommends a practitioner to place a sign if the skew angle of an intersection is 75 degrees or less. The addition of this language will require a NO TURN ON RED sign unless there is justification not to place it. Johnny added that at signalized intersections, the problems associated with skewed intersections are compounded by higher traffic volumes, fewer gaps in some cases, and more information for older drivers to process. The following language is proposed in lieu of the existing "option":

> *Guidance:*
> *A symbolic NO TURN ON RED (R10-11) sign (see Figure 2B-19) should be used on the near right or left of skewed intersections where the adjacent approach leg to the left intersects the driver's approach leg at an angle of less than 75 degrees.*
> *Option:*
>
> A symbolic NO TURN ON RED (R10-11) sign (see Figure 2B-19) may be used on the near right or left of extremely wide intersections.

Chairman Fisher asked Johnny whether he wants to address all the three items together or separately.

Gerry Meis responded that each item needs a separate motion, therefore they should be addressed separately.

Chairman Fisher asked for comments from Committee members.

Jacob Babico asked if the proposed R10-11 sign in the agenda packet is different compared to the adopted sign. The adopted sign has a red symbol below the verbal message, and the sign shown in the agenda packet shows the red symbol between the "no turn" and "on red".

Johnny responded that it was a graphic mistake, there is no intention to change the sign.

Gerry Meis stated that in the interest of older drivers he supports the adoption of the proposed language.

Hamid Bahadori stated that he supports the proposal and even will go one step further to make this standard instead of guidance.

Johnny responded that with the proposed language the practitioners have some leeway so as not to consider the sign if it is not justified. If this is a standard, then there is neither option nor any exception available if an agency decided not to place this sign.

Chairman Fisher stated that there are other signs that can be used for the same purpose and he suggested those options should be available, because different locations may be beneficial from different signs.

Johnny agreed.

Chairman Fisher asked if the proposed language could be amended with language allowing the option to use other signs. He further asked this sign to be placed on the left side. He suggested striking out the option about the placement of "left" side.

Johnny agreed to amend the language as suggested and also agreed to allow the option to use other signs prohibiting right turn movement.

Chairman Fisher asked comments from the audience.

Gain Aggarwal asked if there is a need to have this proposed language? Some cities have intersections up to seven legs, and in that condition, this sign would be required.

Johnny responded that the proposed language is not mandatory, it is a guidance only, if there is justification not to place the sign, then an agency does not have to do so. However, the proposed language will force an agency to review the location closely.

Chairman Fisher asked for other comments. There were none.

Motion: Moved by Jacob Babico, seconded by Gerry Meis, adopted the proposed language with the deletion of "or left" and allowing the option to use either "no right turn" symbol sign or R10-11 verbal message sign.

Motion carried 7-0.

Chairman asked Johnny to address the next item.

Johnny stated that next item is number 14. He explained about the numbering background. There are total of 35 items from the FHWA guidelines on which "Older Driver Safety Task Force" is working on, and numbers already have been given. Johnny stated that the existing MUTCD 2003, Section 2C.50 is as follows:

Section 2C.50 CROSS TRAFFIC DOES NOT STOP Plaque (W4-4p)

Option:
The CROSS TRAFFIC DOES NOT STOP (W4-4p) plaque (see Figure 2C-8) may be used in combination with a STOP sign when engineering judgment indicates that conditions are present that are causing or could cause drivers to misinterpret the intersection as an all-way stop.

Alternate messages such as TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP or ONCOMING TRAFFIC DOES NOT STOP may be used on the W4-4p plaque when such messages more accurately describe the traffic controls established at the intersection.

Standard:
If the W4-4p plaque is used, it shall be installed below the STOP sign.

Johnny stated that proposed language is additional to the above "option" and it will read as follows:

Option:
The CROSS TRAFFIC DOES NOT STOP (W4-4p) plaque (see Figure 2C-8) may be used in combination with a STOP sign when engineering judgment indicates that conditions are present that are causing or could cause drivers to misinterpret the intersection as an all-way stop.

The CROSS TRAFFIC DOES NOT STOP (W4-4p) plaque (see Figure 2C-8) may be used in combination with a STOP sign at two-way stop-controlled intersections when a conversion from four-way stop to two-way stop operations is implemented.

Alternate messages such as TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP or ONCOMING

TRAFFIC DOES NOT STOP may be used on the W4-4p plaque when such messages more accurately describe the traffic controls established at the intersection.

Standard:
If the W4-4p plaque is used, it shall be installed below the STOP sign.

Johnny further added that a two-way stop requires a driver to cross traffic streams from either direction; this poses a potential risk, because cross traffic may be proceeding rapidly and drivers may be less prepared to accommodate to errors made by crossing or turning drivers. Most critically, drivers proceeding straight through the intersection must be aware of the fact that the cross-street traffic does not stop, and that they must yield to cross-street vehicles from each direction before proceeding through the intersection. Older drivers are disproportionately penalized by the late realization of this operating condition. The proposed language when ever a four way stop is converted to a two way stop sign will remind the drivers that cross traffic does not stop.

Chairman Fisher asked comments from Committee members.

Hamid Bahadori stated that he would go one step further and change "may" to "should."

Johnny responded that if the "may" condition changes to a "should" condition, then the proposed language will be placed under "guidance".

Chairman Fisher asked comments from the audience.

Gain Aggarwal stated that he has seen this sign placed with a "double arrowhead" at the bottom of the sign and he believes in providing additional information to drivers the reinforcement the message. He then questioned why a four-way stop sign is change to a two-way stop sign. Converting a four-way stop to two-way stop sign is a degradation of an intersection.

Johnny responded that in the past California used to have an arrowhead sign that was not consistent with the MUTCD. During the update of the MUTCD 2000 to 2003, there were numerous comments from other states in

regards to the arrowhead signs. The final MUTCD 2003 was published without that option. The other concern is already addressed in the MUTCD 2003.

Robert Thomson, County of Fresno, stated that they use this sign very often.

Roger Bazely asked why not use a yield sign.

Johnny responded that the main street has free flow traffic and a yield sign can not be used because cross traffic is controlled by a stop sign.

There was no other comment.

Motion: Moved by Hamid Bahadori, seconded by Jacob Babico, to adopt the proposed language, however the "may" condition will be changed to a "should" condition.

Motion carried 7-0

Chairman Fisher asked Johnny addressed the third item.

Johnny stated that recommendation #16, MUTCD 2003 Section 4E.10, Pedestrian Intervals and Signal Phases, the existing language under option is as follows:

> Guidance:
> The pedestrian clearance time should be sufficient to allow a pedestrian crossing in the crosswalk who left the curb or shoulder during the WALKING PERSON (symbolizing WALK) signal indication to travel at a walking speed of 1.2 m (4 ft) per second, to at least the far side of the traveled way or to a median of sufficient width for pedestrians to wait. Where pedestrians who walk slower than 1.2 m (4 ft) per second, or pedestrians who use wheelchairs, routinely use the crosswalk, a walking speed of less than 1.2 m (4 ft) per second should be considered in determining the pedestrian clearance time.

The Proposed CA Supplement Section 4E.10 text will be an addition to the above MUTCD language and it would be as follows:

> Guidance:
>
> The pedestrian clearance time should be sufficient to allow a pedestrian crossing in the crosswalk who left the curb or shoulder during the WALKING PERSON (symbolizing WALK) signal indication to travel at a walking speed of 1.2 m (4 ft) per second, to at least the far side of the traveled way or to a median of sufficient width for pedestrians to wait. Where pedestrians who walk slower than 1.2 m (4 ft) per second, or pedestrians who use wheelchairs, routinely use the crosswalk, a walking speed of less than 1.2 m (4 ft) per second should be considered in determining the pedestrian clearance time.
>
> *Where older pedestrians routinely use the crosswalk, a walking speed of 0.85 m (2.8 ft) per second should be considered in determining the pedestrian clearance time.*

Johnny stated that numerous studies have indicated that older pedestrians (age 65 and older) took significantly longer than younger pedestrians to cross the street. The average walking speed of the older was 2.8 feet per second (fps). He added that the MUTCD does allow less than 4 feet per second if older pedestrians use the intersection. However, the proposed language would provide a clear guidance instead of using an arbitrary number if engineers consider less than 4 feet per second.

Chairman Fisher asked comments from Committee members.

Jacob Babico asked how you define "older pedestrians" who routinely use the crosswalk. What would be the percentage of older pedestrians of the total pedestrians and what would be their age?

Johnny responded that the existing MUTCD language also used the word "routinely", the difference is; the proposed language will provide guidance to engineers if they are using less than 4 fps, then 2.8 fps is appropriate to use, because it is based on several studies.

Farhad Masourian stated that the current policy allow to use less than 4 fps if the facility is used by older pedestrian. The proposed language suggested if an agency use less than 4 fps then, use 2.8 fps which is supported by studies. With the proposed language, an agency has valid number that can be used, before they were picking an arbitrary number.

Hamid Bahadori stated that this might defeat the purpose, because now a public agency can accommodate older pedestrians by using less than 4 fps, they can choose 3, 3.5 3.8 fps, whatever is required based on field review. If you force them to use 2.8 fps, then they might try justifying 4 fps as appropriate to use.

Jesse Bhullar stated that it all depends on the public agency, if old pedestrians are using a facility, then they need to see if a lower walking speed could be justified.

Gerry Meis stated that the proposed language is guidance, and is not mandatory.

Chairman Fisher stated that the proposal does not require any thinking it simply tells you, if you go lower than 4 fps then use 2.8 fps. When the current practice allows going lower, there is latitude, to go 3, 3.4, and 3.5. 3.7 fps, whatever is determined by the study. He added that the back up information regarding this item quotes a study conducted in Los Angeles that supports 2.8 fps. The City of Los Angeles has conducted a study at approximately 70 to 100 intersections to accommodate pedestrian needs and various walk times were adjusted. Some walk phases were adjusted to 3 seconds, 3.5, 3.7 and even 2.7 seconds. The study was conducted by the senior citizen centers, social security office, hospital and facilities which were used by older pedestrians.

Farhad agreed with Chairman Fisher's comments and suggested the proposed language could be revised which says: If an agency uses less than 4 fps, then use 2.8 fps unless studies indicate to use a different walk.

Johnny agreed that the proposal could be modified, by default use 2.8 fps, unless studies justify using different numbers.

Chairman Fisher stated that the current language could be modifies as follows:

> Guidance:
>
> Where pedestrians who walk slower than 1.2 m (4 ft) per second, or pedestrians who use wheelchairs, routinely use the crosswalk, a walking speed of less than 1.2 m (4 ft) per second should be considered ~~in determining the pedestrian clearance time~~ *based on a study*.

Chairman fisher asked comments from the audience.

Matt Schmitz, FHWA stated that the use of 2.8 fps would have a tremendous effect on the capacity of an intersection. However, both the MUTCD 2003 and California Supplement does allow use of less than 4 fps, if the intersection is used by older pedestrians. The 2.8-fps gives "a number" to practitioners that are based on several studies and this is not an arbitrary number. He added that the existing language is fine, however the proposal gives "a number" instead of pick and choose.

Chalap Sadam, Consultant, Albert Grover & Associates stated that the proposal would take away green time from the main street. This will require more lanes at the intersection to push traffic through the intersection. In some cases there is no room to add an extra lane. He questioned that if the existing language allows use of less than 4 fps, then why is there a need to specify 2.8 fps. When a designer sees a number they will try to use it and it will disturb the flow of traffic.

Farhad Mansourian responded that the capacity of the intersection would be effected if the walk phase is calculated using 2.8 fps. Anyhow, that is given in both the MUTCD 2003 and the California Supplement that a walk speed less

than 4 fps can be used if the intersection is used by older pedestrians. The proposed language gives practitioners a number, if they decided to go lower than 4 fps, they do not have to pick and choose.

Matt stated that the proposed language is very weak (should be considered). The proposed language might add older and wheel chair pedestrians instead of older pedestrians.

Johnny responded that wheelchair pedestrians were not mentioned in the study, therefore, the term old pedestrian was used which is consistent with the studies.

Reza Moghissi, County of Sacramento stated that he has concerns with the proposed language because it pressures traffic engineers to use 2.8 fps and it will compromise the capacity of the intersection. He suggested reviewing the report closely to see if 2.8 fps is a right number. Under the current practice, traffic engineer reviews operations of the intersection closely and balances the traffic and non-motorized traffic. If practitioners are forced to use 2.8 fps it would be counter productive.

Roger Bazely stated that instead of using only older pedestrians, he believes the term senior, disabled pedestrian should be used. He suggested school zones should also be covered in this category.

Gain Aggarwal stated that he received a telephone call from a citizen who requested to adjust the walk phase at a major intersection based on his need. The person was not even able to walk 2 fps. Gain added that he offered him a transportation alternative to take him point A to point B. There is another problem, if a major arterial has a coordination system and one of the intersections readjusts using 2.8-fps walk phase it will screw the whole corridor progression. He advocated leaving the existing language as is and if there is a need to go lower, let the engineers decide what is a reasonable time to accommodate older pedestrians. There needs to be balance between the traffic and non-motorized traffic.

Matt Schmitz commented to leave the guidance as is and add this language under the support.

Jesse Bhullar stated that the recommendation is if older pedestrians use the facility. If there is no older pedestrians, you do not have to make changes. Furthermore, it is guidance. The engineers need look at safety versus operation and decide which is important.

There were no other comments from the audience.

Chairman Fisher stated that many practitioners criticize the 4-fps number. He added that if the Committee recommended 2.8-fps, and eventually this would take over, then no one would use engineering judgement. There are a number of studies underway to pinpoint what is the right number for older pedestrians. The current language allows using less than 4-fps, however, he opposed including 2.8-fps in the California Supplement.

Farhad Masourian agreed with Chairman's comments and suggested that most of the agencies do not have staff to study. They would use 4-fps because it is available. The 2.8-fps would give them a number in the absence of a study. He asked Johnny to provide a traffic study report to Committee members and let them do their homework and continue this item for the next meeting.

Hamid Bahadori agreed with Farhad's comments.

Chairman Fisher asked to continue the item on the agenda and asked Johnny to provide a Los Angeles study and Australia study to members for review.

04-14 Proposed California Supplement Target Compliance Dates

Chairman Fisher asked Gerry Meis to address agenda item 04-14, proposal to include target compliance dates in the California Supplement. Gerry Meis stated that during the August workshop this information was shared with Committee members. Gerry invited Johnny Bhullar to share the proposal with the Committee and the audience.

Johnny stated that working with the Committee on the MUTCD adoption along with the California Supplement, a number of new devices have been adopted in California and some of the current devices became obsolete. Caltrans and the Committee agreed that there is a need to provide guidance to local agencies and practitioners about implementation of target compliance dates. The proposed language will be included in the California Supplement. The MUTCD has compliance dates which varies from 2 to 15 years. Caltrans has determined that the most of the devices in the field will stay in place during their useful life and even if there is inventory stocked, they could be used. Any new installation or replacement should be consistent with new standards. He further added some of the devices were determined that they must be replaced or removed from the field due to safety reasons. Those devices have been included in to the attached table with target dates to remove or replace with approved devices by specific dates.

Jacob Babico asked why some of the signs are not included in this table.

Johnny responded that any sign or device not included in the table could stay in the field during their useful service life. The list includes only those devices that were determined to be replaced or removed before their useful service life is up, and the dates are shown in the table when they are to be removed or replaced.

Jacob asked if there are compliance dates shown in the MUTCD 2003.

Johnny responded that the proposed language will supersede all those dates and the MUTCD dates will not be applicable in California.

Hamid Bahadori stated that there is a need to communicate this information with local agencies. Hamid added that ITE is a good resource to disseminate information.

Gerry Meis stated that there is a need to disseminate this information with local agencies, he suggested that if the Committee agreed with the proposal then it will be posted on the California Supplement web site.

Chairman Fisher stated that he supports the adoption of the proposed language and asked for comments from the audience.

Gain Aggarwal asked about the pavement markings.

Johnny responded that any device which is not included in this Table could stay in the field to their useful life.

Robert Thomson stated that this policy would be very useful for local agencies. He added that without this policy, Fresno County has to look at 6000 intersections that would require new requirements. He suggested that this information should posted with a cover letter.

There were no other comments.

Motion: Moved by Chairman Fisher, seconded by Gerry Meis, adopted the proposal on target compliance dates as included in the agenda packet. The proposed language will be posted with a cover letter.

Chairman Fisher asked discussion on the motion.

Farhad Mansourian asked that the Committee members who represent local agencies should share this list and policy with the counter partners.

Motion carried 7-0.

Johnny Bhullar stated that during the MUTCD orientation training he was sharing this information with the participants.

The following proposal is planned to include in California Supplement.

To be added to Introduction part of the CA Supplement): Target Compliance Dates {For non-compliant Traffic Control Devices (TCD) on existing highways}.

Standard:

Unless allowed per the Option below, in cases involving new highway or bikeway construction or reconstruction, the traffic control devices installed (temporary or permanent) shall be in conformance with the MUTCD 2003 and the California Supplement to the MUTCD 2003 before that highway is opened or re-opened to the public for unrestricted travel pursuant to the California Vehicle Code 21401.

Option:

In cases involving new highway or bikeway construction or reconstruction, the traffic control devices installed (temporary or permanent) may be in accordance with pre May 20, 2004 traffic control device standards per Caltrans Traffic Manual, if in the judgement of the engineer, incorporating the MUTCD 2003 and the California Supplement standards would impose a significant delay or a significant increase in costs for the project.

Support:

Reconstruction, as used in the Standard and Option topics above, for the purpose of a traffic control device would mean if a particular device is modified in any form or shape or is relocated. If a reconstruction project does not modify or relocate a traffic control device, although encouraged, there would be no obligation to upgrade the traffic control device per MUTCD 2003 and the California Supplement standards.

Standard:

Unless allowed per the option below, non-compliant traffic control devices on existing highways and bikeways shall be brought into compliance with the MUTCD 2003 and the California Supplement as part of the systematic upgrading of substandard traffic control devices (and installation of new required traffic control devices) required pursuant to the California Vehicle Code 21401.

Option:

All traffic control devices on existing highways and bikeways that have become non-compliant per MUTCD 2003 and the California Supplement adopted standards may remain in service through the end of their useful service life, unless identified specifically with a target compliance date per the list that follows.

To limit financial impact on agencies and for fiscal responsibility reasons, existing inventory of non-compliant traffic control devices may continue to be used until these inventories are depleted.

Standard:

The target compliance dates listed in the Introduction part of the MUTCD are deleted and shall not apply in California.

<u>The following traffic control devices on existing highways that are non-compliant per the MUTCD 2003 and the California Supplement have been singled out for specific target compliance dates by the California Traffic Control</u>

Devices Committee and California Department of Transportation. The target compliance dates for these devices shall be as follows:

CA Code	Title/Description	Comment	Target Date
R16B	NO RIGHT TURN word message sign	Use MUTCD R3-1 No Right Turn symbol sign	**January 1, 2010**
R17B	NO LEFT TURN word message sign	Use MUTCD R3-2 No Left Turn symbol sign	**January 1, 2010**
R19	NO LEFT OR U TURN word message sign	Use MUTCD R3-18 No Left or U Turn symbol sign	**January 1, 2010**
R34A	No U TURN word message sign	Use MUTCD R3-4 No U Turn symbol sign	**January 1, 2010**
SR2-M	SPEED LIMIT 35 mph 56 km/h sign	1976 Metric sign never implemented	**January 1, 2007**
SR3-M	END 35 mph 56 km/h SPEED LIMIT sign	1976 Metric sign never implemented	**January 1, 2007**
SR24-1	STOP ON RED SIGNAL word message sign	Use MUTCD R10-6 STOP HERE ON RED with arrow sign	**January 1, 2010**
SR31	SCHOOL STOP CROSSING round shape Paddle	Use CA Code C28A octagon shape Paddle	**January 1, 2010**
SR36	CLOSED Red on White octagon shape sign	Use MUTCD R11-2 ROAD CLOSED sign	**January 1, 2010**
W54	Pedestrian Crossing Symbol with crosswalk lines	Use MUTCD W11-2 Pedestrian Crossing symbol without crosswalk lines & W16-7P diagonal downward pointing arrow plaque	**January 1, 2011**
W66	School Crossing Symbol with crosswalk lines	Use MUTCD S1-1 School Crossing symbol without crosswalk lines & W16-7P diagonal downward pointing arrow plaque	**January 1, 2011**
W66A	SCHOOL XING word message sign	Use MUTCD S1-1 School Crossing symbol without crosswalk lines & W16-7P diagonal downward pointing arrow plaque	**January 1, 2011**
SW1-1	TRAFFIC FROM RIGHT(LEFT) DOES NOT STOP with arrow sign	Use MUTCD W4-4P CROSS TRAFFIC DOES NOT STOP plaque without the arrow	**January 1, 2007**
SW6-M	40 mph - 64 km/h sign	1976 Metric sign never implemented	**January 1, 2007**
SW18-2.1	VERTICAL CLEARANCE ___FT. ___IN.	Use MUTCD W12-2 Low Clearance sign or W12-2P rectangular plaque	**January 1, 2010**
SW25	School Symbol - SCHOOL XING with crosswalk lines	Use MUTCD S1-1 School Crossing symbol without crosswalk lines & W16-7P diagonal downward pointing arrow plaque	**January 1, 2011**
SW27	Skewed RR Crossing symbol with Motorcycle symbol sign	Use MUTCD W10-12 Skewed Crossing symbol sign	**January 1, 2015**
SW27-1	Skewed RR Crossing symbol	Use MUTCD W10-12	**January 1, 2015**

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	with Motorcycle & Bike symbol sign	Skewed Crossing symbol sign	
SW28	STEEL DECK with Motorcycle symbol sign	Use modified CA Code SW28 STEEL BRIDGE DECK word message sign	**January 1, 2015**
SW72-M	EXIT 30 mph 48 km/h sign	1976 Metric sign never implemented	**January 1, 2007**

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Request for Experimentation:

04-9 Request to Experiment with "Watch The Road" sign

Chairman Fisher asked Committee member Hamid Bahadori to address agenda item 04-9, "Watch The Road" sign.

Hamid stated that the City of Los Angeles asked him to represent their experiment request on behalf of the City to experiment with " Watch The Road" roadway signs as part of Los Angeles County's Watch The Road Education and Awareness campaign. This is a very interesting program and the request will test the effectiveness of safety slogan signs as part of a larger traffic safety campaign. Hamid added that in the past five years, Los Angeles County roadways claimed more than 3,550 lives, injured another 440,000 and impacted thousands of families. These deaths and injuries were the result of traffic accidents and for the most part were caused by driving too fast for conditions, aggressive driving and inattentive driving. The Watch the Road campaign began in May 2004 and will run until at least December 2005. A campaign message will be placed via television, radio, billboards, newspapers, magazines, roadway signage, bus stops, exterior and interior bus stops. The City will come back to the committee and share the success/failure of the sign.

Chairman Fisher stated the sign would be used along with other public education campaigns. The city will collect data, if the sign reached the public, as to how the public has changed their behavior. The time period for the proposed experimentation with watch the road signs will follow the schedule of the watch the road campaign from the approval of this request to experiment until the estimated completion of the education and awareness program in May 2006, a period of approximately 18 months.

Lenley Duncan stated that the proposed sign is neither a regulatory nor a warning sign, the Committee should not be involved in this.

Hamid responded any sign in the public right-of-way requires Committee and Caltrans recommendation.

There were no other comments.

Motion: Moved by Farhad Mansourian, seconded by Gerry Meis, to authorize the experimentation with the watch the road sign as requested by the City of Los Angeles.

Motion carried 6-1(Lenley Duncan voted against).

04-10 Slow for the Cone Zone

Chairman Fisher asked Gerry Meis to address the Agenda item slow for the cone zone. Gerry invited Tamie McGowen to address the committee regarding this request.

Tamie McGowen stated that Caltrans is preparing to conduct pilot testing with the slow for the zone campaign, which provides advance warning to motorists and to improve safety in the work zone. A broad usage of effective signs can provide benefits to the traveling public as well as enhance work zone safety.

Tamie stated Caltrans plans to carryout experiments on four construction projects: two on Interstate Highway I-80 near Auburn and other two are on I-15 and I-215 near San Bernardino. The experimentation team expects to collect data initially in the period of January-June of 2005. If there is a need for further studies, the team will extend the scope of the study to other locations afterwards. The experimentation team will work with Caltrans to determine the appropriate locations and duration for the work.

To determine the effectiveness of the new sign, it is desirable to assess how traffic is affected by the signage. For example, observations can be made before and after the signs are in place to collect traffic data. The data can be analyzed to depict the distribution of vehicle speeds near and at the signs and work zones.

Tamie added that the principal investigator for this proposal is Dr. Ching-Yao Chan, an Associate Research Engineer and Manager of Enabling Technology Group at PATH. Dr. Chan has extensive research and development experiences in the areas of transportation safety and technology.

Chairman Fisher asked for comments from Committee members.

Hamid Bahadori asked whether all current signs such as “road work ahead” would still be used.

Tamie responded that the proposed sign would be addition to the current signs.

Chairman Fisher asked for comments from the audience. There were none.

Motion: Moved by Hamid Bahadori, Seconded by Ed von Borstel, to approve the experiment with “Slow For The Cone Zone” signs as requested by Caltrans.

Motion carried 7-0.

04-11 Bicycle May Use Full Lane

Chairman Fisher asked Ed Borstel to introduce agenda item 04-11. Ed stated that he has communicated with the City of Santa Cruz regarding this item. However, he has not seen any representative from the City present in the meeting. He proposed to defer this item and it will be placed on the agenda if City requested to do so.

04-12 Request for experimentation with "Flashing Yellow Arrow"

Chairman Fisher asked Hamid Bahadori to introduce agenda item 04-11 Flashing Yellow Arrow (FYA) experiment requested by the City of Pasadena and Fullerton. Hamid introduced Bahman Janka, Transportation Administrator, City of Pasadena, Chalap Sadam, Vice President, Albert Grover & Associates and asked them to present their request.

Bahman stated that the Cities of Fullerton and Pasadena has submitted an application for an experiment request with FYA during protected permissive left-turn (PPLT) phase at three intersections in each city. He added that the City of Fullerton has applied for and already received approval from FHWA to implement the FYA operation at three intersections.

Chalap Sadam informed the Committee that FHWA has authorized a number of experimentation with FYA throughout the country. The FHWA planned to include the FYA in the next update of the MUTCD. The proposed locations are adjacent to new Light Rail Transit that has been in operation in Pasadena since July of 2003. All intersections are equipped with necessary railroad preemption signal timing features as required. At the intersection of Arroyo Parkway/Glenarm, a recent study concluded that the operation of the intersection and hence the total delay and queue of cars could be improved by converting the east/west approaches to a protected/permissive operation. The other two intersections currently operate under PPLT phasing, however, their operation could be improved by using the FYA concept.

Chalap went through a PowerPoint presentation. The FYA is better understood than the currently used green ball display. The use of FYA for permissive intervals with PPLT control allows for versatility in application: protected/permissive, protected only or permissive. The FYA will eliminate the left-turn trap, the FYA is displayed concurrently with opposing green ball. PPLT can operate as leading or lagging. Side street phases can be skipped and leading left-turn safely reintroduced. Protected left-turn can be vehicle activated. The overall goal is to improve signal operation, enhance safety, and reduce delay.

He added that under the PPLT phasing for approaches leading to the railroad tracks, the traffic signal is subject to the railroad preemption features which could lead to a left turn trap. This is caused when the signal is operating in the east/west direction crossing the RR tracks. Once the signal goes to track clearance phase, the signal is forced to terminate one through green(means going to yellow) while keeping the opposing approach green. In order to overcome this left turn trap, the signal is programmed to revert to the north/south movement for at least 10-15 seconds before returning to the track clearance phase. The FYA operation simplifies the signal timing and eliminates the left turn trap situation by being able to "lag" a phase during the track clearance phase. The experiment will be for three years period, unless terminated earlier due to safety reasons and the Cities will provide three years "Before and After" crash data.

Chairman Fisher asked comments from Committee members.

Farhad Mansourian stated that this is a good experiment.

Gain Aggarwal asked what happens if the main street opposing traffic has a green phase.

Janka responded that FYA is tied with the opposing green, it will come on when opposing traffic has green.

There were no other comments.

Motion: Moved by Gerry Meis, seconded by John Fisher, to authorize the experiment with "Flashing Yellow Arrow" as requested by the City of Pasadena and Fullerton.

Motion carried 7-0.

Discussion Items

04-E Timetable for Combining the MUTCD 2003 and California Supplement to a Single Document

Chairman Fisher stated that this item was placed on the agenda because the Committee has requested Caltrans to combine two documents (MUTCD 2003 and California Supplement) to a single document so end users can use them effectively. Chairman Fisher pointed out that Johnny Bhullar is primarily responsible for the task and has provided six different alternatives to combining these documents. He asked Johnny to elaborate on the different alternatives.

Johnny stated that in the agenda packet there are alternatives as follows:

- Alternative 1 – Existing Separate Documents
- Alternative 2A – Showing only applicable policies (Margin line for CA policy)
- Alternative 2B – Showing only applicable policies (Italic text for CA policy)
- Alternative 2C – Showing only applicable policies (Blue text for CA policy)
- Alternative 3A – Showing applicable policies with Edits (Margin line for CA policy)
- Alternative 3B – Showing applicable policies with Edits (Italic text for CA policy)
- Alternative 3C – Showing applicable policies with Edits (Blue text for CA policy)

He further added that there are alternatives for the figures as follows:

- Alternative 1 – Existing separate figures and/or comments
- Alternative 2 – Showing only applicable figure
- Alternative 3 – Showing applicable figures with Edits

Johnny explained the different alternatives in detail and also shared the advantages and disadvantages over each.

After a considerable discussion, Committee members agreed to combine the text part with alternatives 3A and 3C, which will show margin lines and blue text of California Supplement. The purpose of using margin lines (Alternative 3A) in combination with the blue text (Alternative 3C) is to provide a distinction for those persons with non-color printers or photocopies.

The Committee members further agreed to select alternative 3 for figures.

Johnny stated that during the next CTCDC meeting he will bring Part 6, Temporary Traffic Control and Part 7, Traffic Controls for School Areas combined versions that will provide an idea about the final product. The combining of MUTCD 2003 and California Supplement for each of these Parts will also provide a rough estimate for a timetable to complete the task.

Chairman Fisher thanked Johnny for the update and for heading up to achieve this final task.

04-F Section 2C.46 of MUTCD 2003, Advisory Speed Plaque (W13-1)

Chairman Fisher asked Jacob Babico to discuss agenda item 04-F Section 2C.46, Advisory Speed Plaque (W13-1).

Jacob stated that the MUTCD and CA Supplement does allow the use of advisory speed on warning signs. He would like to know what would be the appropriate distance to place intersection warning (W2-1 or W2-2) signs with a supplemented advisory speed plaque (W13-1), when a corner side distance is limited. Jacob further stated that the guidelines for placement of advance warning signs provided in the MUTCD 1988, 2000, AASHTO and MUTCD 2003 are not consistent.

Johnny responded that if a corner distance is known or available in the field, the advisory speed could be calculated by using Table 2C-4 of the MUTCD 2003. Johnny further noted that California has adopted the MUTCD 2003 along with the CA Supplement, and to place advance-warning signs, the practitioner follows these documents. The MUTCD 1988 and 2000 were not applicable in California, and at that time, the State Traffic Manual was the standard for the placement of traffic control devices.

The Committee members agreed with Johnny's comments.

04-G Overhead Pedestrian/School Crosswalk Signing With Yellow Flashing Beacons

The item was deferred for the next CTCDC meeting.

04-5 Roundabout Signs & Pavement Markings Guidance Proposal

Chairman Fisher asked Gerry Meis to address agenda item "roundabout signs & pavement markings." Gerry Meis invited Jerry Champa to share the information with the Committee.

Jerry Champa, Office Chief, Division of Traffic Operations, Headquarters, stated that there are two diagrams in the agenda packet and this is the result of discussion with the Committee during the last meeting. There are diagrams in the agenda packet. The Diagram A is a recommended practice to use and it shows only shark teeth which act as both edge line and also yield line for the traffic. The Diagram B shows edge line and shark teeth in front of the edge line, this scenario is recommended where additional emphasis is needed. Both scenarios will have shark teeth. The recommended diagram will eliminate the edge line, and yield line markings will be used for both the edge line and yield line. He added that Caltrans is still working with consultants and with local agencies to prepare final guidelines for roundabout signs and pavement, and that they will bring it to the Committee for review and recommendations.

The Committee thanked Jerry for sharing the information and for accommodating the comment made during the previous meeting.

Next Meeting: The next meeting will be held on March 24, 2005 in the Multipurpose Conference Room 01.040A, Caltrans D 7 Office, 100 South Main St., Los Angeles 90012.

Adjourn: The meeting was adjourned at 3:30 PM. Motion moved by Gerry Meis and seconded by Farhad Mansourian. Motion carried 7-0.

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